

Claims

1. A method of inhibiting aggregation of complex particles in which a drug is adhered to lead particles, characterized by containing a lipid derivative or a fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or a surfactant in the lead particles.

2. The method of inhibiting aggregation of complex particles according to claim 1, wherein the lipid derivative or the fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or the surfactant is a lipid derivative or a fatty acid derivative of a water-soluble polymer.

3. The method of inhibiting aggregation of complex particles according to claim 1, wherein the lipid derivative or the fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or the surfactant is one or more substance(s) selected from polyethylene glycolated lipids, polyethylene glycol sorbitan fatty acid esters, polyethylene glycol fatty acid esters, polyglycerolated lipids, polyglycerol fatty acid esters, polyoxyethylene

polypropylene glycol, glycerol fatty acid esters and polyethylene glycol alkyl ethers.

4. The method of inhibiting aggregation of complex particles according to any one of claims 1 to 3, wherein the complex particles in which a drug is adhered to lead particles are complex particles obtained by dispersing or dissolving the drug so as to be contained in a liquid in which the lead particles are dispersed and allowing the drug adhered to the lead particles.

5. The method of inhibiting aggregation of complex particles according to any one of claims 1 to 4, wherein the complex particles in which a drug is adhered to lead particles are complex particles in which a drug is electrostatically adhered to lead particles.

6. The method of inhibiting aggregation of complex particles according to any one of claims 1 to 5, wherein the lead particles are lead particles having electrostatic charge opposite to that of the drug.

7. The method of inhibiting aggregation of complex particles according to any one of claims 1 to 6, wherein the lead particles are fine particles containing as a

constituent component liposome containing a lipid with electrostatic charge opposite to that of the drug.

8. The method of inhibiting aggregation of complex particles according to any one of claims 1 to 7, wherein the drug is a nucleic acid.

9. The method of inhibiting aggregation of complex particles according to claim 8, wherein the nucleic acid as the drug is one or more substance(s) selected from genes, DNA, RNA, oligonucleotides, plasmids and siRNA.

10. The method of inhibiting aggregation of complex particles according to any one of claims 1 to 9, wherein the complex particles in which a drug is adhered to lead particles are complex particles in which a drug and an adhesion-competitive agent are adhered to lead particles.

11. The method of inhibiting aggregation of complex particles according to claim 10, wherein the complex particles in which a drug and an adhesion-competitive agent are adhered to lead particles are complex particles obtained by dispersing or dissolving the drug and the adhesion-competitive agent so as to be contained in a liquid in which the lead particles are dispersed and

allowing the drug and the adhesion-competitive agent adhered to the lead particles.

12. The method of inhibiting aggregation of complex particles according to claim 10 or 11, wherein the complex particles in which a drug and an adhesion- competitive agent are adhered to lead particles are complex particles in which a drug and an adhesion-competitive agent are electrostatically adhered to lead particles.

13. The method of inhibiting aggregation of complex particles according to any one of claims 10 to 12, wherein the adhesion-competitive agent is one or more substance(s) selected from lipids, surfactants, nucleic acids, proteins, peptides and polymers.

14. The method of inhibiting aggregation of complex particles according to any one of claims 10 to 12, wherein the adhesion-competitive agent is one or more substance(s) selected from dextran sulfate, sodium dextran sulfate, chondroitin sulfate, sodium chondroitin sulfate, hyaluronic acid, chondroitin, dertaman sulfate, heparan sulfate, heparin, ketaran sulfate and dextran fluorescein anionic.

15. An inhibitor for aggregation of complex particles in which a drug is adhered to lead particles, containing a lipid derivative or a fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or a surfactant.

16. The inhibitor for aggregation of complex particles according to claim 15, wherein the lipid derivative or the fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or the surfactant is a lipid derivative or a fatty acid derivative of a water-soluble polymer.

17. The inhibitor for aggregation of complex particles according to claim 15, wherein the lipid derivative or the fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or the surfactant is one or more substance(s) selected from polyethylene glycolated lipids, polyethylene glycol sorbitan fatty acid esters, polyethylene glycol fatty acid esters, polyglycerolated lipids, polyglycerol fatty acid esters, polyoxyethylene polypropylene glycol, glycerol fatty acid esters and polyethylene glycol alkyl ethers.

18. A method of producing complex particles in which a nucleic acid as a drug adhered to lead particles, comprising the step of dispersing or dissolving the nucleic acid as a drug so as to be contained in a liquid in which the lead particles containing a lipid derivative or a fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or a surfactant are dispersed, thereby allowing the nucleic acid as a drug adhered to the lead particles.

19. A method of producing complex particles in which a drug is adhered to lead particles, comprising the step of dispersing or dissolving the drug and an adhesion-competitive agent so as to be contained in a liquid in which the lead particles containing a lipid derivative or a fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or a surfactant are dispersed, thereby allowing the drug and the adhesion-competitive agent adhered to the lead particles.

20. The method of producing complex particles according to claim 19, wherein the adhesion-competitive agent is one or more substance(s) selected from lipids, surfactants,

nucleic acids, proteins, peptides and polymers.

21. The method of producing complex particles according to claim 19, wherein the adhesion-competitive agent is one or more substance(s) selected from dextran sulfate, sodium dextran sulfate, chondroitin sulfate, sodium chondroitin sulfate, hyaluronic acid, chondroitin, dertaman sulfate, heparan sulfate, heparin, ketaran sulfate and dextran fluorescein anionic.

22. The method of producing complex particles according to any one of claims 19 to 21, wherein the drug is a nucleic acid.

23. The method of producing complex particles according to claim 18 or 22, wherein the nucleic acid as the drug is one or more substance(s) selected from genes, DNA, RNA, oligonucleotides, plasmids and siRNA.

24. The method of producing complex particles according to any one of claims 18 to 23, wherein the lipid derivative or the fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or the surfactant is a lipid derivative or a fatty acid derivative of a water-soluble

polymer.

25. The method of producing complex particles according to any one of claims 18 to 23, wherein the lipid derivative or the fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or the surfactant is one or more substance(s) selected from polyethylene glycolated lipids, polyethylene glycol sorbitan fatty acid esters, polyethylene glycol fatty acid esters, polyglycerolated lipids, polyglycerol fatty acid esters, polyoxyethylene polypropylene glycol, glycerol fatty acid esters and polyethylene glycol alkyl ethers.

26. The method of producing complex particles according to any one of claims 18 to 25, wherein the lead particles are lead particles having electrostatic charge opposite to that of the drug.

27. The method of producing complex particles according to any one of claims 18 to 25, wherein the lead particles are fine particles containing as a constituent component liposome containing a lipid with electrostatic charge opposite to that of the drug.

28. Complex particles which can be produced by the method of producing complex particles according to any one of claims 18 to 27.

29. Complex particles comprising:

lead particles containing a lipid derivative or a fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or a surfactant; and

a nucleic acid as a drug adhered to the lead particles.

30. Complex particles comprising:

lead particles containing a lipid derivative or a fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or a surfactant;

a drug adhered to the lead particles; and

an adhesion-competitive agent adhered to the lead particles.

31. The complex particles according to claim 30, wherein the adhesion-competitive agent is one or more substance(s) selected from lipids, surfactants, nucleic acids, proteins, peptides and polymers.

32. The complex particles according to claim 30, wherein the adhesion-competitive agent is one or more substance(s) selected from dextran sulfate, sodium dextran sulfate, chondroitin sulfate, sodium chondroitin sulfate, hyaluronic acid, chondroitin, dertaman sulfate, heparan sulfate, heparin, ketaran sulfate and dextran fluorescein anionic.

33. The complex particles according to any one of claims 30 to 32, wherein the drug is a nucleic acid.

34. The complex particles according to claim 29 or 33, wherein the nucleic acid as the drug is one or more substance(s) selected from genes, DNA, RNA, plasmids and siRNA.

35. The complex particles according to any one of claims 29 to 34, wherein the lipid derivative or the fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or the surfactant is a lipid derivative or a fatty acid derivative of a water-soluble polymer.

36. The complex particles according to any one of claims

29 to 34, wherein the lipid derivative or the fatty acid derivative of one or more substance(s) selected from sugars, peptides, nucleic acids and water-soluble polymers or the surfactant is one or more substance(s) selected from polyethylene glycolated lipids, polyethylene glycol sorbitan fatty acid esters, polyethylene glycol fatty acid esters, polyglycerolated lipids, polyglycerol fatty acid esters, polyoxyethylene polypropylene glycol, glycerol fatty acid esters and polyethylene glycol alkyl ethers.

37. The complex particles according to any one of claims 29 to 36, wherein the lead particles are lead particles having electrostatic charge opposite to that of the drug.

38. The complex particles according to any one of claims 29 to 36, wherein the lead particles are fine particles containing as a constituent component liposome containing a lipid with electrostatic charge opposite to that of the drug.

39. A method of producing coated complex particles comprising the steps of:

preparing a liquid (liquid A) containing a polar organic solvent in which the complex particles according to any one of claims 28 to 38 are dispersed and a coating

layer component is dissolved; and

coating the complex particles with a coating layer composed of the coating layer component by reducing the ratio of the polar organic solvent in the liquid A.

40. The method of producing coated complex particles according to claim 39, wherein the step of preparing the liquid A comprises the steps of:

preparing a liquid (liquid B) containing a polar organic solvent in which the complex particles according to any one of claims 28 to 38 are dispersed;

preparing a liquid (liquid C) obtained by dissolving the coating layer component in a solvent containing a polar organic solvent which is the same as or different from that in the liquid B; and

mixing the liquid B and the liquid C.

41. The method of producing coated complex particles according to claim 39 or 40, wherein the coating layer is a lipid membrane.

42. The method of producing coated complex particles according to claim 41, wherein the coating layer is a coating layer containing a water-soluble polymer derivative.

43. Coated complex particles which can be produced by the method of producing coated complex particles according to any one of claims 39 to 42.

44. Coated complex particles comprising the complex particles according to any one of claims 28 to 38 and a coating layer for coating the complex particles, wherein in a solvent containing a polar solvent at a concentration within a range where the complex particles are not dissolved and can be dispersed therein, a coating layer component constituting the coating layer is dissolved when the concentration of the polar solvent is relatively high, and is deposited or assembled when the concentration of the polar solvent is relatively low.

45. The coated complex particles according to claim 44, wherein the coating layer is a lipid membrane.

46. The coated complex particles according to claim 45, wherein the coating layer is a coating layer containing a water-soluble polymer derivative.

47. The coated complex particles according to any one of claims 44 to 46, wherein the average particles diameter of

the coated complex particles are 300 nm or less.